Disparities in Deaths from Chronic Liver Disease and Cirrhosis

Los Angeles County, 2000-2008

Office of Health Assessment and Epidemiology **June 2012**

County of Los Angeles Public Health

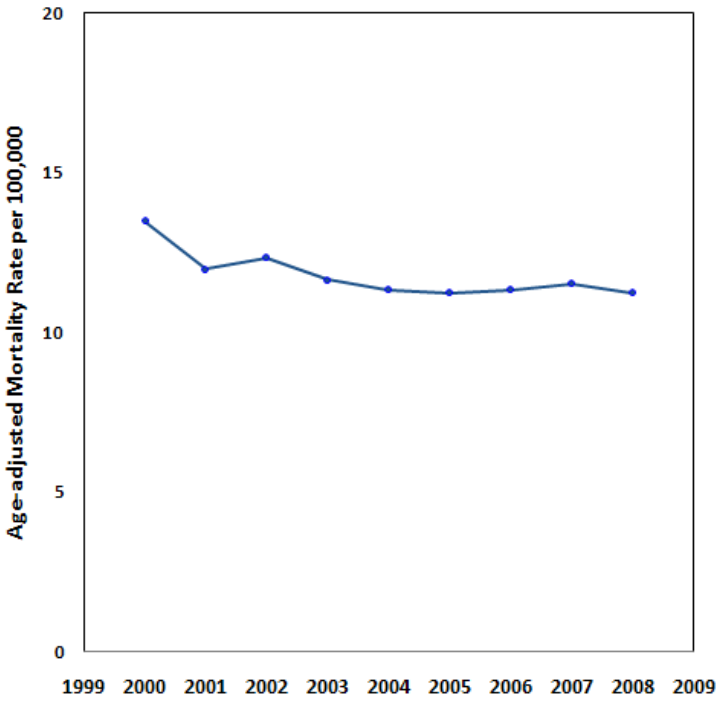
Chronic Liver Disease and Cirrhosis

An Unrecognized Health Problem

Chronic liver disease and cirrhosis (CLD) is a leading cause of disease burden in Los Angeles County (LAC), often affecting people during their most productive years. In 2008, CLD was the 9th leading cause of death in the county, and the 5th leading cause of premature death (death before the age of 75), resulting in 1,134 deaths and 19,749 years of life lost.

Between 2000 and 2008, little progress was made in reducing CLD mortality. While the mortality rates for most other leading causes of death declined significantly over this period,[1] the age-adjusted mortality rate for CLD has changed little since 2001. (Figure 1)

Figure 1: Chronic Liver Disease and Cirrhosis Mortality Rate, Los Angeles County, 2000-2008



Furthermore, there are striking disparities. Deaths from chronic liver disease and cirrhosis are much more common among men, who account for more than two-thirds of CLD deaths (69%), and among Hispanics, who have the highest mortality rates for CLD. Liver disease is an over-looked health concern among Hispanics, especially among Hispanic males, where CLD is second only to heart disease as a leading cause of death.

In Los Angeles County, the mortality rate for Hispanics (18.4 deaths per 100,000) was nearly five times the rate among Asians/Pacific Islanders (PIs), who had the lowest rate (3.8 deaths per 100,000). African Americans and whites showed comparable death rates, though the mortality rate may be declining among African Americans. (Figure 2) Compared with national averages, the rates of liver disease mortality in LAC are higher for whites and Asians/PIs, and markedly higher for Hispanics. (Figure 3) Given that the Hispanic population has been increasing rapidly and is soon expected to exceed half of the county population, it is imperative that the causes of these disparities are addressed.

The most common causes of chronic liver disease, excessive alcohol consumption, chronic infection with hepatitis B or hepatitis C, and drug toxicity, are preventable. We hope the information provided will help strengthen efforts to prevent future deaths and reduce the burden of liver disease in our communities.

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Figure 2: CLD Mortality Rate by Race/Ethnicity, Los Angeles County, 2000-2008

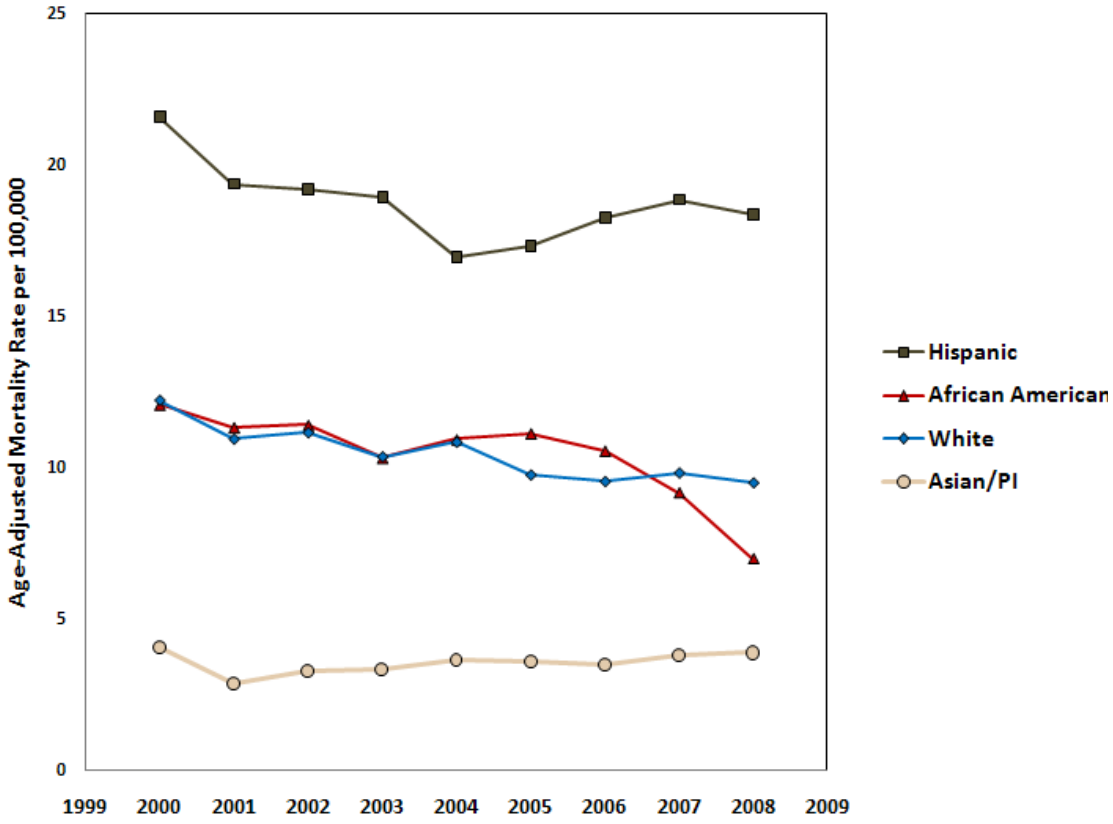
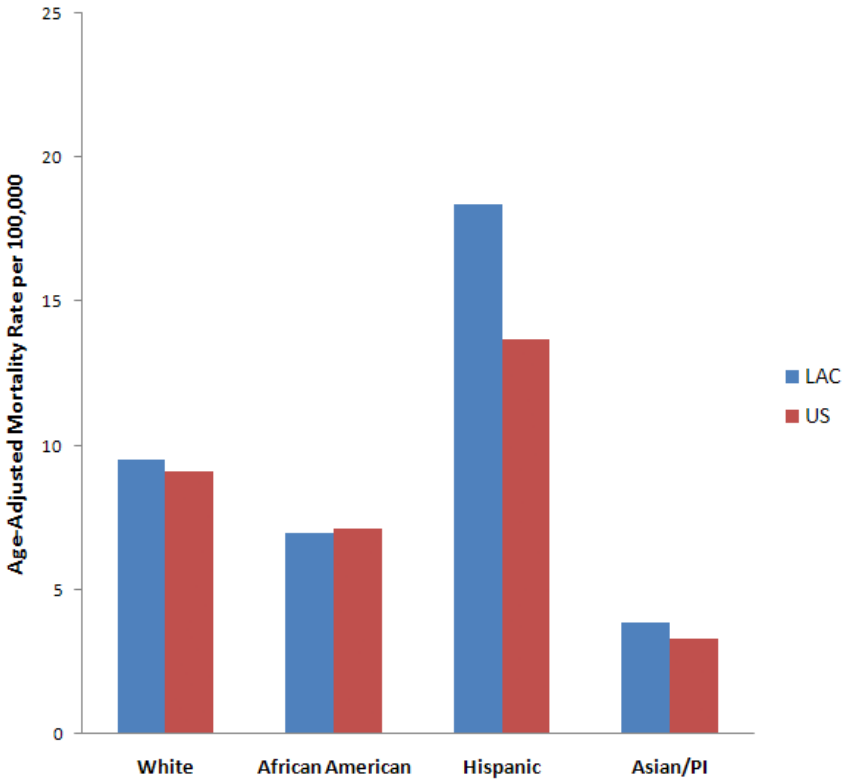


Figure 3: CLD Mortality Rate by Race/Ethnicity, Los Angeles County vs. U.S., 2008



Mortality Trends in Chronic Liver Disease and Cirrhosis

Table 1 summarizes the changes in mortality rates in the county between 2000 and 2008. Although the overall mortality rate for CLD[2] appears to have decreased slightly, this decline was not significant. There was a small decline between 2000 and 2001, but the mortality rate has remained relatively unchanged since then. Similarly, mortality rates by gender and racial/ethnic groups also showed no significant declining trends. Though the mortality rate among African Americans appears to be trending downward, this trend was not significant. Among Hispanics, the death rate trended downward slightly from 21.6 in 2000 to 18.4 deaths per 100,000 in 2008, but the number of deaths per year increased from 499 to 594, likely due to population growth within this demographic subgroup.

Adults aged 45-64 years accounted for the most CLD deaths, followed by those 65 years or older. Mortality rates were highest in SPAs 1 (Antelope Valley), 6 (South), and 7 (East), and lowest in SPA 5 (West), (Figures 4 and 5) and is related to the percentage of Hispanics living in those areas.

Table 1: Number* and Rates (per 100,000) of CLD Deaths, Los Angeles County, 2000-2008

	2000	2001	2002	2003	2004	2005	2006	2007	2008
	No. [Rate]	No. [Rate]	No. [Rate]	No. [Rate]	No. [Rate]	No. [Rate]	No. [Rate]	No. [Rate]	No. [Rate]
Los Angeles County									
Overall	1,121 [14]	1,010 [12]	1,085 [12]	1,053 [12]	1,035 [11]	1,061 [11]	1,102 [11]	1,133 [12]	1,134 [11]
Gender									
Male	760 [20]	695 [18]	741 [18]	727 [17]	698 [16]	759 [17]	758 [17]	792 [17]	765 [16]
Female	361 [8]	315 [7]	344 [7]	326 [7]	337 [7]	302 [6]	344 [7]	341 [7]	355 [7]
Race/ethnicity									
White	461 [12]	416 [11]	434 [11]	403 [10]	428 [11]	397 [10]	386 [10]	396 [10]	398 [10]
Hispanic	499 [22]	458 [19]	504 [19]	498 [19]	458 [17]	501 [17]	554 [18]	586 [19]	594 [18]
African American	102 [12]	97 [11]	100 [11]	92 [10]	98 [11]	102 [11]	98 [11]	86 [9]	69 [7]
Asian/PI	46 [4]	32 [3]	39 [3]	42 [3]	46 [4]	48 [4]	49 [4]	55 [4]	59 [4]
Age-group									
18-44y	215 [5]	146 [4]	187 [5]	174 [4]	142 [3]	138 [3]	151 [4]	157 [4]	167 [4]
45-64y	531 [29]	547 [28]	583 [29]	551 [26]	565 [26]	566 [25]	631 [27]	631 [27]	620 [26]
65+y	375 [40]	315 [33]	312 [32]	328 [33]	328 [33]	354 [35]	320 [31]	345 [32]	347 [31]
Service Planning Area (SPA)									
SPA 1	40 [16]	40 [16]	35 [13]	48 [18]	40 [13]	39 [13]	43 [14]	50 [16]	45 [14]
SPA 2	187 [11]	144 [8]	168 [9]	180 [9]	190 [10]	199 [10]	200 [9]	189 [9]	207 [9]
SPA 3	191 [12]	187 [12]	178 [11]	177 [10]	173 [10]	197 [11]	207 [11]	179 [10]	194 [10]
SPA 4	151 [16]	136 [14]	159 [16]	134 [13]	131 [12]	127 [11]	136 [12]	144 [12]	147 [12]
SPA 5	56 [9]	45 [7]	55 [8]	55 [8]	40 [6]	41 [6]	41 [6]	44 [6]	40 [5]
SPA 6	117 [18]	110 [17]	119 [17]	106 [14]	118 [17]	102 [14]	120 [16]	122 [16]	112 [14]
SPA 7	197 [19]	161 [15]	185 [17]	177 [16]	173 [16]	176 [15]	163 [14]	199 [17]	198 [16]
SPA 8	165 [13]	154 [11]	162 [12]	155 [11]	139 [10]	159 [11]	156 [10]	184 [12]	174 [11]

*Counts may not add up to county totals due to a small percentage of individual death records being incomplete; mortality rates are age-adjusted according to 2000 U.S. standard population.

Figure 4: Number of CLD Deaths by Service Planning Area, Los Angeles County, 2008

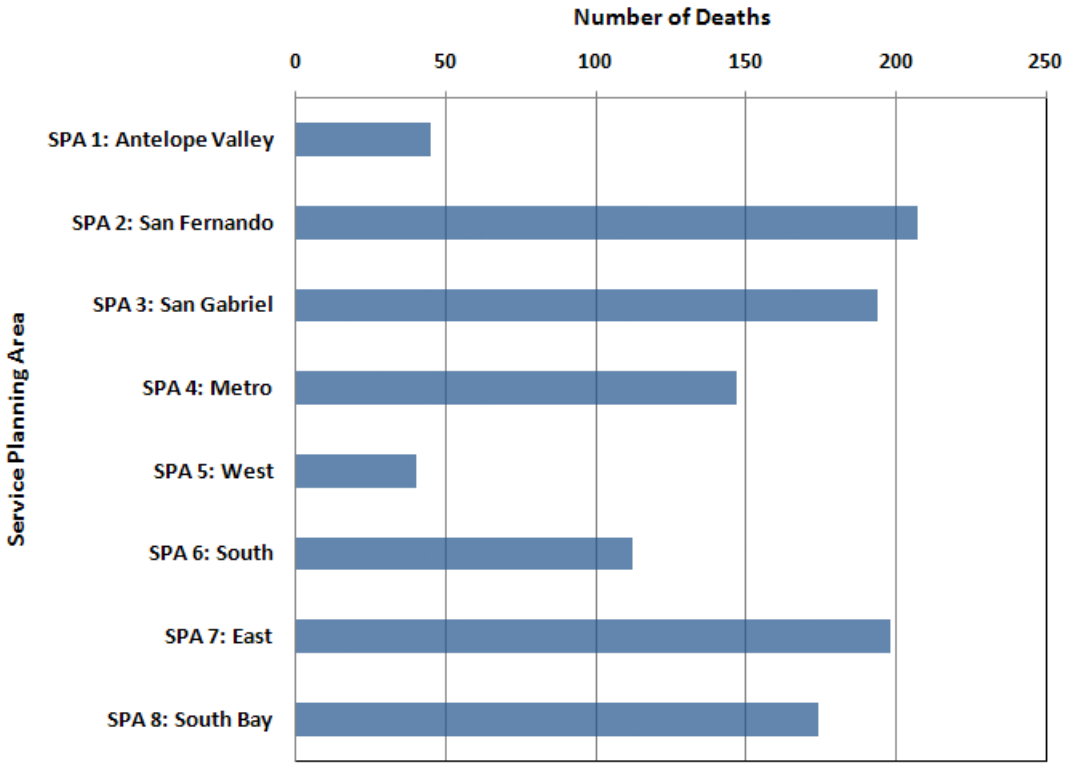
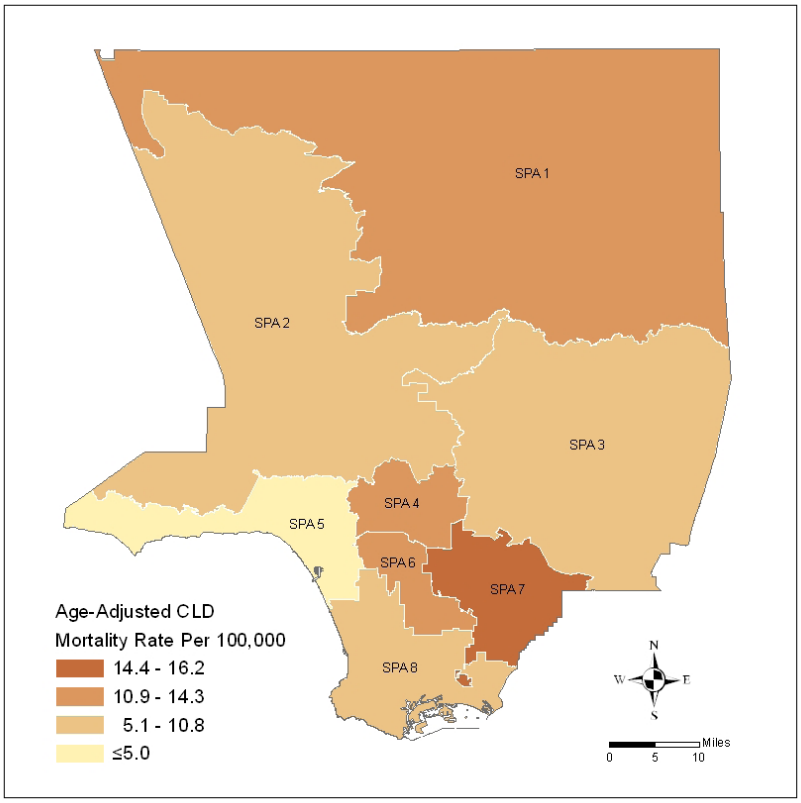
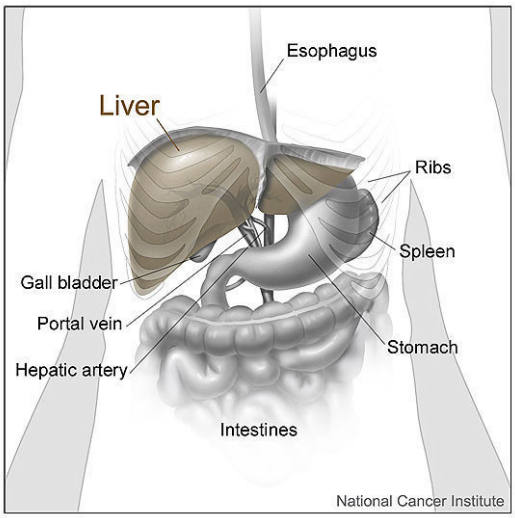


Figure 5: CLD Mortality Rate by Service Planning Area, Los Angeles County, 2008



Major Causes of Chronic Liver Disease and Cirrhosis

The vast majority of deaths from chronic liver disease and cirrhosis (as defined in this report)[2] are due to excessive alcohol intake (68%). Fibrosis and cirrhosis comprise the majority of the remaining deaths, and include deaths due to chronic viral hepatitis infection. (Figure 6) CLD deaths do not include liver cancer. In addition to alcohol, other leading contributors to CLD are infection with hepatitis B or C, drug-induced liver toxicity, and obesity.



Excessive Alcohol Intake

Alcoholic liver disease (ALD) is responsible for more than two-thirds of CLD deaths. In addition to the toxic effects of alcohol itself, alcoholics, binge drinkers, and other heavy alcohol users are more susceptible to drug toxicity because alcohol causes liver injury that alters drug metabolism.

Rates of binge drinking in LAC are highest among Hispanics, while rates of heavy drinking are highest among African Americans and whites.[3] One study found that age-adjusted hospitalization rates due to ALD were highest among Hispanic men, with rates 2.4 times higher than those of whites.[4]

Hepatitis B and/or Hepatitis C Infection

Chronic infection with viral hepatitis B (HBV) or hepatitis C (HCV) can also lead to liver injury, inflammation, and cirrhosis. Chronic hepatitis B/C develops when the body cannot get rid of the virus. After acute HBV infection, a person's risk of developing chronic infection varies inversely with age. It occurs among about 90% of infants infected at birth, 20-50% of children infected from 1 to 5 years, and 1-10% of persons infected as older children and adults. Among persons with HCV infection, most (75%-85%) develop chronic infection.[5]

Drug-induced Liver Toxicity

The liver performs hundreds of vital functions including metabolizing drugs and removing toxins from the bloodstream, breaking them down so that they can be eliminated from the body. Many over-the-counter and prescription drugs can cause liver damage when misused. Breakdown byproducts can also damage the liver. See the text box on page 9 for a list of common drugs that can cause liver damage.

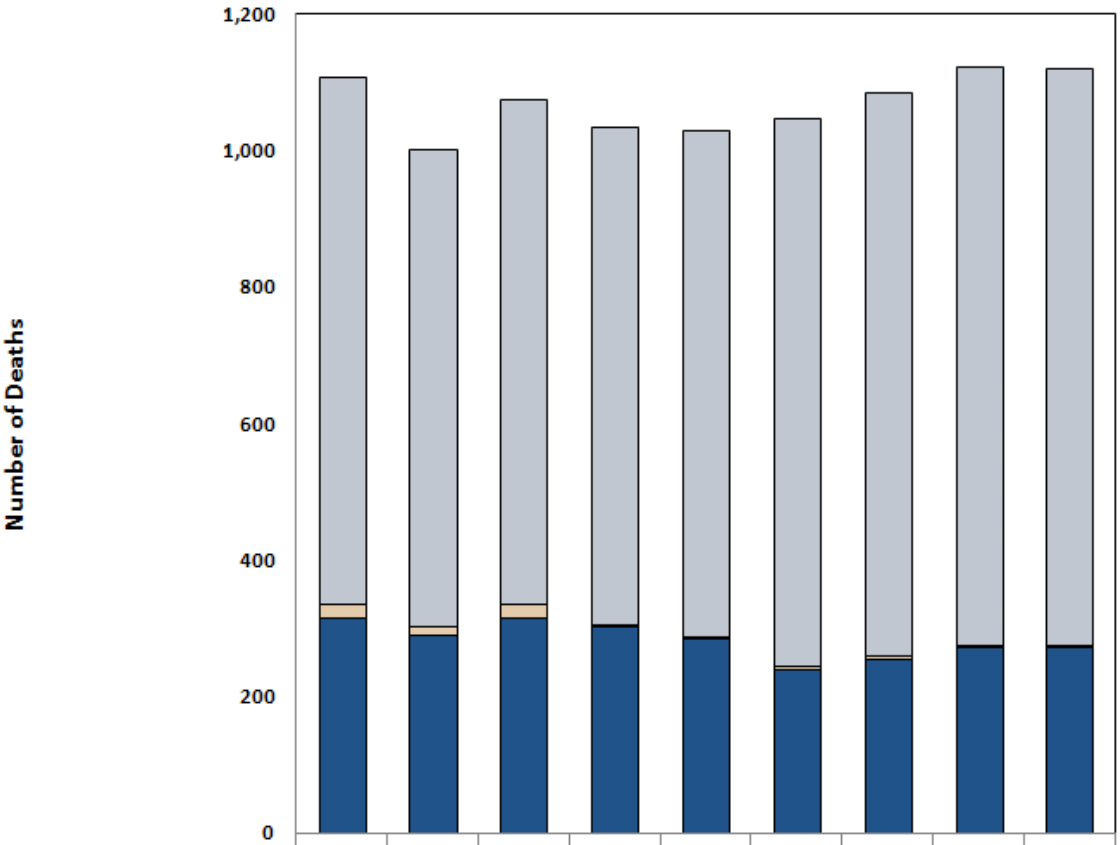
Obesity

Obesity leads to fat deposition in liver cells, a condition known as non-alcoholic fatty liver disease (NAFLD), that results in inflammation. The prevalence of NAFLD has been increasing in the U.S.,[6] and parallels increases in levels of obesity, diabetes, and insulin resistance. NAFLD is the leading cause of chronic liver disease among children and adolescents.[7,8]

Furthermore, NAFLD appears to be more common among Hispanics than among other racial/ethnic groups.[9] Obese Hispanic children have been found to have excess visceral and liver fat deposition, and potentially increased susceptibility to developing NAFLD.[10] While the overall contribution of NAFLD to CLD deaths is currently very small, it is expected to rise as we continue to struggle with high rates of obesity and diabetes, especially among Hispanics.

Finally, studies indicate that risk factors for CLD are additive.[11] Those with multiple risk factors, such as men or women who are obese and who drink heavily, may be much more likely to develop liver disease. Among Hispanics, who not only appear to be at higher risk for liver injury, but also have higher rates of both obesity and binge drinking, the potential for developing chronic liver disease is considerably increased.

Figure 6: CLD Deaths by ICD-10 Code, Los Angeles County, 2000-2008



	2000	2001	2002	2003	2004	2005	2006	2007	2008
K70 Alcoholic Liver Disease	771	701	740	729	741	802	827	848	845
K73 Chronic Hepatitis	20	11	20	2	2	5	6	3	1
K74 Fibrosis & Cirrhosis	317	291	315	304	287	241	254	272	274

A Progressive, Chronic Process

Chronic liver disease is a gradual process that ends in the destruction of liver tissue and the loss of liver function. Although the causes for liver disease vary, the diseases follow similar pathways. In the early stages of disease, injury to the liver causes inflammation, a condition known as hepatitis. Although the liver has a great capacity to regenerate itself, repeated exposure to harmful factors such as alcohol, or infection with hepatitis B/C, leads to a cycle of liver injury, healing, and re-injury, eventually leading to fibrosis, the accumulation of connective and scar tissue in the liver. The liver architecture becomes diffusely abnormal, and this interferes with blood flow and function. Upon reaching a critical point of scarring, the liver can no longer function or heal, a condition known as cirrhosis. Damage to this extent is irreversible.

What Can Be Done?

The most common causes of liver damage are preventable.

Avoid excessive alcohol consumption

While light to moderate alcohol consumption has been associated with modest health benefits, heavy drinking or binge drinking increases a person's risk for many alcohol-related problems.

The most effective way to prevent over-consumption of alcohol is to make alcohol less easily available and less affordable.[12]

Excessive Drinking[20]

Men
- More than 5 drinks on one occasion (Binge)
- More than 2 drinks per day on average (Heavy)

Women
- More than 4 drinks on one occasion (Binge)
- More than 1 drink per day on average (Heavy)

- Limit alcohol availability by restricting hours of sale, days of sale, types of beverages sold, and number of liquor outlets per neighborhood.[13]
- Change the economics of alcoholic beverages by increasing alcohol taxes. California's alcohol tax per gallon is below the national average for wine, beer, and liquor.[14] Increasing taxes can lead to a reduction in excessive alcohol consumption and related harms.[15]
- Ensure that the owner or server of a retail alcohol establishment where a customer recently consumed alcoholic beverages be held legally responsible for harms inflicted by that customer (dram shop liability).[15]
- Reduce alcohol advertising in public places and in areas commonly seen by minors. Marketing increases youth awareness of alcohol. Enacting stricter marketing laws in order to curb exposure can be beneficial.
- Enhance enforcement of laws prohibiting sale of alcohol to minors.[15]
- Provide alcohol education. Educational interventions by health care providers have also been shown to be effective, particularly if the patient is paired with a health care provider from the same background.[16]
- Increase screening by health care providers. Early detection and intervention is an important step in curbing alcohol abuse.[17,18] See the May-June 2010 Rx for Prevention article, "Screening for Alcohol Misuse and Abuse"[19] for some helpful guidelines.

Prevent viral hepatitis infections

The most effective way to prevent viral hepatitis infections is through vaccination.

- Vaccinate people at high risk for hepatitis A and B. Vaccination provides the best protection against both hepatitis A and B. Although acute hepatitis A infection doesn't progress to chronic infection, persons with chronic liver disease have an elevated risk of death from hepatitis A.[21,22]
- HBV spreads from the blood, semen, or other body fluid infected with HBV to an uninfected person, most commonly through sex or injection drug use. Hepatitis B vaccination is recommended for all children as well as most adults, since most adults have some risk for acquiring HBV. For additional information on HBV and vaccination recommendations, please visit: http://www.cdc.gov/vaccines/vpd-vac/hepb/.
- No vaccination is currently available to protect against infection by hepatitis C. HCV is most commonly spread through injection drug use and contact with infected blood or blood products. Infection can also result from sexual contact with an infected partner, though this is less common. HBV and HCV infection can be prevented by not sharing needles, using a condom during sex, and wearing gloves before touching another person's blood.

- Persons at higher risk for HBV or HCV, or who think they may have been exposed, should get tested. Many people don't know they are infected. Early diagnosis and treatment can help prevent liver damage.

Prevent drug-induced liver damage

Follow provider and manufacturer instructions when taking over-the-counter and prescription drugs.

- The liver is one of the principal organs through which drugs are detoxified and excreted from the body.
- Many drugs may cause liver damage ranging from mild dysfunction to complete failure resulting in death.
- Pain-relieving and fever-reducing drugs are some of the most widely used medications and may cause liver damage when taken at high doses, more frequently than recommended, or when combined with alcohol.

Common drugs that can cause liver damage

Over the counter pain relievers
- acetaminophen (Tylenol, paracetamol)
- acetaminophen narcotic combinations (e.g. Vicodin)
- aspirin
- ibuprofen (Advil, Motrin)
- naproxen (Aleve)
- indomethacin

Prescription medications
- valproic acid
- phenytoin
- niacin
- statins (e.g. atorvastatin, lovastatin, simvastatin)
- amiodarone
- methotrexate
- ketoconazole
- some antibiotics (e.g. isoniazid)
- some antivirals
- anabolic steroids

Herbal supplements and vitamins
- chaparral
- comfrey
- kava
- Ma-Huang (ephedra)

- Children can also develop liver damage if they mistake vitamin supplements for candy and take large doses
- Many industrial chemicals such as vinyl chloride, carbon tetrachloride, and paraquat, can also be toxic to the liver. For a full list, go to http://hazmap.nlm.nih.gov.

Maintain a healthy body weight

Obesity and diabetes are associated with increased risk of NAFLD, and obesity in LAC is at critical levels. While the overall contribution of NAFLD to CLD deaths is currently very small, as levels of obesity and diabetes rise, CLD deaths from NAFLD are expected to rise as well.[23]

- Eat more fruits and vegetables and whole grains.
- Start every day with a healthy breakfast, and eat meals with your kids.
- Incorporate physical activity into your daily routine.
- Get your body moving everyday for at least 30 minutes a day (for adults), and 60 minutes a day (for children).

Helpful Online Resources

American Liver Foundation (ALF) is a leading nonprofit organization in promoting liver health and disease prevention through advocacy, research, as well as providing educational and support services to patients with liver diseases, healthcare providers, and the public.

www.liverfoundation.org

American Association for the Study of Liver Disease (AASLD), founded by scientists and healthcare professionals committed to preventing and curing liver disease, aims to advance the science and practice of hepatology through medical training, conferences, research, and professional publications.

www.aasld.org

National Institute of Alcohol Abuse and Alcoholism (NIAAA) is part of the national effort to reduce alcohol-related problems by conducting research in alcohol consumption, prevention, and treatment; coordinating and collaborating with other government and nonprofit institutes; and translating and disseminating research findings to the health field, policymakers, and the public.

www.niaaa.nih.gov

National Digestive Diseases Information Clearinghouse (NDDIC) is a health information service established to increase knowledge and understanding about digestive diseases including liver-related illnesses.

www.digestive.niddk.nih.gov

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